

IN THE SPECIFICATION

1. Please amend the paragraph at Page 4, Lines 20 – 32, at line 22, to replace the word unmeasurable with the proper word, immeasurable. There is no change in meaning.

Heretofore, however, this “visual haze” or “visible haze” of an article has never been considered separate and apart from the physical haze of the article, as it is generally ~~unmeasurable~~ immeasurable by traditional physical testing of the article. By “visual haze” or “visible haze,” it is meant that haze which can be observed optically or visually by a person in ordinary direct or indirect light. It is the haze that is visible to the naked eye of the observer, presumably due to the reflectance or transmittance of the light from the filler domains present in the article. It is believed that the visual masking of the physical haze phenomenon results in the elimination or reduction of this “visual haze,” and can provide an article suitable for commercial use. To that end, it will be understood that “visual haze” is not a measured physical property to the same extent that the physical haze of an article is determinable on a colorimeter or the like, and eliminating or reducing visual haze may or may not reduce the measured physical haze of the article.

2. Please amend the paragraph at page 8, line 16 – page 9, line 3 at page 8, line 27; replacing the “then” with the proper comparative word “than”.

Yet one or more other aspects of the present invention may further be achieved by a process for the production of a transparent article made of a blend of a major component of polyester, a minor component of at least one incompatible filler dispersed therein, and at least one light absorbent composition, comprising blending a selected amount of the filler into the polyester; forming an article into a desired size and shape, wherein domains comprising the incompatible filler are created in the polyester upon formation of the article; determining a range of dimensions in the axial plane of the article for the domains in the polyester, at least some of the dimensions falling within a range of from about 400 nm to about 700 nm; blending a selected amount of light absorbent composition into the polyester to determine that the light absorbent composition absorbs light in a region of the visible spectrum such that X is less ~~then~~ than 9.6 in the equation

$$X = \sum (1 - A_i) \times (N_i)$$

where A_i is the percent of light absorbed at a wavelength i and N_i is the number of domains per hundred square microns at wavelength i , and where i ranges from 400 nm to 700 nm; and adding that selected amount of the light absorbent composition to the polyester and the selected amount of incompatible filler and forming a different, transparent container into the same desired size and shape, thereby substantially masking any visual haze in the article.

3. Please amend the paragraph at page 13, lines 18-29; at line 22 to change the spelling of “as” to its proper word of “at”.

It will be appreciated that the determination of whether a light absorbent composition will absorb light for a particular article below an X threshold is relatively simple and can be determined without undue experimentation. A_i is the percent of light absorbed by the article having the colorant without the incompatible filler as at wavelength i ; L_i is the percent of light available to reflect at wavelength i , where i is 400 nm to 700 nm. These percentages can be calculated upon measuring the absorbance of the composition, it being understood that $A_i + L_i = 1$. In most instances, L_i will be 1 minus the percent absorbed, or the percent of light available for reflectance. These measurements can be obtained using the process described below. N_i is the number of domains per hundred square microns at wavelength i , where i is 400 nm to 700 nm. N_i can be measured by SEM and normalized to square microns.

4. Please amend the paragraph at page 14, line 30 – Page 15 line 5, at line 3, removing the space between nm and the period “.”.

The intensity of the light at wavelength i may be pertinent in some instances, and can be factored into the equation as I_i as follows

$$X = 300 \sum (L_i) \times (N_i) \times (I_i)$$

where I_i is the intensity of a source of light at the wavelength divided by the total light between 400 nm to ~~700 nm~~ 700 nm. Where a spectrophotometer that measures the percent light is used, I_i is 1/300 and, therefore, multiplying by 300 normalizes the light to a common standard.

5. Please amend the paragraph at page 16, lines 15 -34, at line 24 to correct the spelling of employed to employed.

Upon formation of the article, a domain 28 is created in the polymer matrix 22 which essentially includes both the discrete particle 24 and void 26, or the entire minor phase 27 of the incompatible filler. Where the incompatible filler used in the present invention is moldable and stretchable like the polymer employed in the article, orientation or stretching of the article will cause the incompatible filler, like the polymer, to spread along the axial plane of the article and to narrow in the transverse plane of the article as the wall of the article becomes thinner. However, in instances where the filler is not stretchable like the polymer, a void or voids 26 may be left between the filler and the polymer. Where a polyamide and another thermoplastic polymer other than the thermoplastic polymer ~~employed~~ employed as the matrix polymer, e.g., polyester, are utilized as the filler, the void left, if any, will generally be *de minimus* since both of the thermoplastic polymers are stretchable and deformable. Thus, the domains created in the matrix polymer are essentially the volume of the minor phases themselves. Nevertheless, for purposes of this invention, it will be understood that, where non-deformable filler particles are utilized, a domain 28 includes not only the volume of the filler particle 24, but also any additional volume in the article of any void 26 between the filler particle 24 and the polymer 22. Where the article has not been stretched, the domain will match the volume of the filler particle.

6. Please amend the paragraph at page 19, lines 17 – 24 lines 8 – 10, at line 4, change the “a” to “an” so as to correct the grammar.

Turning to the components of the article, the present invention includes a thermoplastic polymer matrix having a an incompatible filler dispersed therein. The incompatible filler is preferably present in an amount of about 0.5 to about 50 percent by weight based on the weight of polymer. In one embodiment, a polyester, preferably PET, may comprise from about 99.5 to about 50 percent by weight of the article as the major component and the incompatible filler, preferably MXD-6, may comprise from about 0.5 to about 50 percent by weight of the article as the minor component.

7. Please amend the paragraph at page 22, lines 22 – page 23, at lines 30 and 31 and 32, removing the errant space between “°C” and the respective punctuation mark.

The melt phase polymerization described above may be followed by a crystallization step, then a solid phase polymerization (SSP) step to achieve the intrinsic viscosity necessary for the manufacture of certain articles such as bottles. The crystallization and polymerization can be performed in a tumbler dryer reaction in a batch-type system. Alternatively, the crystallization and polymerization can be accomplished in a continuous solid state process whereby the polymer flows from one vessel to another after its predetermined treatment in each vessel. The crystallization conditions preferably include a temperature of from about 100 °C to about ~~150 °C~~, 150 °C. The solid phase polymerization conditions preferably include a temperature of from about 200 °C to about ~~232 °C~~, 232 °C, and more preferably from about 215 °C to about ~~232 °C~~, 232 °C. The solid phase polymerization may be carried out for a time sufficient to raise the intrinsic viscosity to the desired level, which will depend upon the application. For a typical bottle application, the preferred intrinsic viscosity is from about 0.65 to about 1.0 deciliter/gram, as determined by ASTM D-4603-86 at 30 °C in a 60/40 by weight mixture of phenol and tetrachloroethane. The time required to reach this viscosity may range from about 8 to about 21 hours. In one embodiment of the invention, the article-forming polyester of the present invention may comprise recycled polyester or materials derived from recycled polyester, such as polyester monomers, catalysts, and oligomers.

8. Please amend the paragraph at page 24, lines 4 – 16 at line 14 to correct the spelling of isophthlamide to isophthalamide.

Where a polyamide is employed as the incompatible filler, the polyamide component of the present invention may be represented by repeating unit A-D, where A is the residue of a dicarboxylic acid including adipic acid, isophthalic acid, terephthalic acid, 1,4-cyclohexanedicarboxylic acid, resorcinol dicarboxylic acid, naphthalene-2,6-dicarboxylic acid or a mixture thereof, and D is the residue of a diamine including *m*-xylylene diamine, *p*-xylylene diamine, hexamethylene diamine, ethylene diamine, 1,4-cyclohexanedimethylamine or a mixture thereof. Preferred polyamides that can be used in this invention includes poly(*m*-xylylene adipamide) or a copolymer thereof, isophthalic or terephthalic acid-modified poly(*m*-xylylene adipamide), nylon 6, nylon 6,6 or a mixture thereof, poly(hexamethylene ~~isophthlamide~~ isophthalamide), poly(hexamethylene adipamide-co-isophthalamide), poly(hexamethylene adipamide-co-isophthalamide), poly(hexamethylene adipamide-co-terephthalamide) or poly(hexamethylene isophthalamide-co-terephthalamide).

9. Please amend the paragraph at page 25, lines 8 to 19, at lines 10/11 inserting the word “be” to correct the grammar.

Mixing or blending of a polyester resin and polyxylylene amide may be carried out in an extruder under known conditions of temperature and shear forces so as to ensure proper mixing and to create a fine, stable dispersion of the polyamide in the polyester matrix. In one embodiment, the polyester and filler of the present invention is generally prepared using a well known technique known as the “shake and bake” method. Typically, polyester, such as PET, and polyamide polymers, as well as the light absorbent composition when it is time, are mixed into a masterbatch, shaken until thoroughly mixed and poured into the hopper to be extruded or molded into preforms as is well known in the art. Shear rates higher than 100 s^{-1} may be used when melt-mixing polyamide. The melt viscosity ratio of the polyester to the polyxylylene amide, elevated at $280\text{ }^{\circ}\text{C}$ at a shear rate of 100 s^{-1} , is preferably between about 3:1 and 8:1.

10. Please amend the paragraph at page 25, lines 20 – Page 26, line 8, at line 4, inserting the phrase “(available from Laboratory Imaging, Prague, Czech Republic)” so as to properly associate the Tradename as noted in the MPEP.

Once blended, the blended components may then be made into a desired size and shape of an article. In one embodiment, the component can be blow molded into the shape of a bottle or other container of a particular size. Once molded, a determination that at least some of the filler domains in the article have dimensions in the axial plane of the container of from about 400 nm to about 700 nm can be made. Such a determination may be made simply by determining that the article has haze visible to the naked eye. In one embodiment, where a more precise determination is desired, the minor phase of the thermoplastic polymer filler can be dissolved out of the polyester matrix by using formic acid. Use of cold formic acid, *i.e.*, formic acid at room temperature, is preferred. As the temperature of hot formic acid is above the T_g of polyester, it is possible that the domains could be relaxed or expanded depending upon the location of the domains. Once dissolved, a measurement of the domain dimensions can be taken as may be known in the art. For example, one method of measuring the domain dimensions is to obtain a scanning electron microscope (SEM) photomicrograph of the article and measure the domain using appropriate equipment and techniques such as by using LuciaM (available from Laboratory Imaging, Prague, Czech Republic) software on the photomicrographs realized at 5000x. It will be appreciated that, however, that the dimensions measured may not all be the longest dimensions for any one domain, although theoretically they should be. In one embodiment, measurements were taken of both the preforms and the container in both the radial and axial directions in the axial plane of the container.

11. Please amend the paragraph at page 26, lines 25 to 29, at line 27, replace the plural spectra with the singular spectrum.

Preferably, these compositions will be colorants commonly used in pigmenting or dyeing of plastics. Essentially any colorant (either a dye or a pigment) may be employed provided it has a suitable ~~spectra~~ spectrum as required for the present invention. The colorant may or may not be compatible with (*i.e.*, hydrophilic to) the polyamide or other filler employed.

12. Please amend the paragraph at page 27, lines 12 to 21, at line 16, replace the “a” before incompatible with “an” to make it grammatically correct.

Alternatively, and as noted above, an effective amount of the light absorbent composition may be added to the thermoplastic polymer and the incompatible filler blend in any manner known in the art. Another container may then be made using known container-making techniques such as blow molding. This new transparent container having a polyester matrix with ~~a~~ an incompatible filler and a light absorbent composition dispersed therein should then be made into the same desired size and shape. A different size and shape may provide different dimensions to the domains found in the article and could change the range of the dimensions and thus, the light absorbent composition required. It should then be evident that the light absorbent composition can substantially mask the haze in the container.

13. Please amend the paragraph at page 27 line 22 to Page 28, at line 11 change the spelling of Mitsuibishi to Mitsubishi and at line 31, change the abbreviation of mL's to ml's.

In order to demonstrate practice of the present invention, a number of preforms were extruded from a blend of polyester, namely polyethylene terephthalate (PET) and about 5 percent by weight polyamide, namely, poly(m-xylylene adipamide), commonly known as MXD-6 and available from ~~Mitsubishi~~ Mitsubishi Gas Chemical (Harada, M., *Plastics Engineering*, 1998). The preforms also contained 0.04 percent by weight 1,2,4,5-benzenetetracarboxylic dianhydride, or pyromellitic dianhydride (PMDA). Upon extrusion, a number of bottle preforms were produced having MXD-6 dispersed within a PET matrix. Some of the preforms were then blow molded into bottles, each bottle having essentially an identical shape and a size of 500 ~~mL's~~ ml's. Upon construction of the bottles, each was cut in both the vertical transverse plane and the horizontal transverse plane and etched in cold formic acid for about 60 minutes, the samples then were washed with water till neutral pH and then with acetone. Obtained samples were metalized (gold) with Agar Auto sputter Coater under subsequent condition: 20mA for 20 seconds with argon flow. The longest dimensions of the remaining MXD-6 domains were measured using LuciaM software on the SEM photomicrographs realized at magnification of 5000x. The photomicrographs were obtained from cutting the bottle in the vertical and horizontal transverse planes and observing the longest dimension which necessarily was the dimension parallel to the surface of the article. In Fig. 7, the distribution of the results obtained from the measure of the longest dimension in the vertical transverse plane, i.e., the radial (X) direction based upon the Figures above, is reported.

14. Please amend the paragraph at page 29, lines 6 to 15, at line 11, remove the word “of” and at line 15, change address to addressed to indicate proper past tense.

The comparison between the measurements performed with the SEM and the absorption spectra of the primary colors available has led to an explanation why the red color seems to be the best color to cover the haze. At this point, however, one must again understand that the results of the SEM give the manufacturer an idea of what are the MXD-6 domain dimensions, but in this approach, the measurements are only an approximation, since it is essentially impossible to cut ~~of~~ the sample in a manner that would provide every domain at its longest diameter. That is, at least some of the domains measured will be slightly smaller than the real diameter, since there is no way to insure that cutting of the bottle will occur in the exact middle of the domains. This issue has been ~~address~~ addressed in detail hereinabove.

15. Please amend the paragraph at page 29, line 16 to Page 30, line; at line 18 and 30, replacing renold with RENOL® to properly associate the mark. At line 15, line 16, and line 31 replacing the plural spectra with the proper singular spectrum. At line 17, correcting 600 mn to the proper spelling of the abbreviation nanometer “nm”.

After viewing the spectra, it is clear that, of the choices provided thus far, red appears to be the best candidate for covering haze, with the best choice being ~~Renol~~ RENOL® Red 4 available from ColorMatrix Corp. Transparent red samples containing the red colorant were prepared and wrapped around a known bottle of the identical size and shape previously prepared. The bottle showed visual haze prior to being wrapped. Upon wrapping the bottle, substantial masking of the haze was observed. Other bottles were prepared to include various colorants. Of those, visual analysis showed that bottles including the colorant Tersar Yellow NE 1105131 available from Clariant provided substantial masking of haze at higher concentration (4%, final bottle has a an orange coloration). When viewing its ~~spectra~~ spectrum in Fig. 8A, it can be seen that, unlike all of the other yellow colorants with spectra provided, the ~~spectra~~ spectrum of the Tersar Yellow colorant showed at least some absorption in the region from 500 to 550 nm and even out to about 600 ~~mn~~ nm. Thus, this colorant was suitable to mask at least some of the haze (or rather the MXD domain) of the bottle. In the same manner, bottles made with about 1 percent ~~Renol~~ RENOL® Blue NE 51050340 available from Clariant also showed some partial masking of the haze. In its ~~spectra~~ spectrum (Fig. 8C), it can be seen that this blue can cover a zone of the MXD-6 domains. In particular, the region starting from 500 nm can be covered. Not all of the region will be masked however, and there was still some visual haze noticeable in the bottle. The same behavior can be found in using the colorant Tersar blue 40642, also available from Clariant (Fig. 8C).

16. Please amend the paragraph at page 30, lines 5 – 15, at line 6 and line 9 replacing the plural spectra with the proper singular spectrum and at line 8 replacing mL with ml.

Figs. 9A, 9B, 9C, and 9D show spectra for various green, orange, purple and pink colorants, respectively. Notably, the ~~spectra~~ spectrum in Fig. 9A shows that adding this particular green colorant will not effectively mask the haze of the bottle. Production of a green colored 500 ~~mL~~ ml bottle using this green colorant confirmed this, a further demonstration that in the region between 475 and 575 (the ~~spectra~~ spectrum region which is not covered by the absorption of this color) there are a large number of MXD-6 domains with this dimension. It will be understood however, that other green colorants may adequately and effectively mask the haze of the bottle. Not all green colorants absorb at the same wavelengths and in the same amounts, and it is entirely possible (as shown below) that other green colorants may provide adequate masking of the visual haze for various articles including bottles.

17. Please amend the paragraph at page 30, lines 16 – 21, at line 18, replacing the plural spectra with the proper singular spectrum.

Bottles made from Blossom orange colorant available from ColorMatrix Corp. showed very good masking of haze, but not total. In fact, upon viewing the ~~spectra~~ spectrum of this color (Fig. 9B), it is possible to observe an absorption until a wavelength of about 575 nm, not enough to cover all the MXD-6 domains. Again, however, it is possible that other orange colorants may not mask the visual haze as well as this particular orange colorant, or may mask the visual haze even better.

18. Please amend the paragraph at page 30, lines 22 – 26, at lines 22 and 25, replacing the plural spectra with the proper singular spectrum. At line 23, replacing mL with mL.

The ~~spectra~~ spectrum (Fig. 9C) of Royal Purple-1 available from ColorMatrix Corp. is seen as one of the best colorants to mask haze of the sample 500 ~~mL~~ mL bottle, although the other purple colorant, Tersar Violet 40058, available from Clairant, also appears to be suitable. The pink ~~spectra~~ spectrum (Fig. 9D) also substantially masks haze in the 450 to 600 nm region.

19. Please amend the paragraph at page 31, lines 1 – 17, at line 3, 13, replacing mL with mL.

Further testing of the present invention included the preparation of additional preforms of the type described hereinabove (PET + 0.04% PMDA + 5% MXD-6) and production of additional 500 ~~mL~~ mL bottles therefrom, as well as the manufacture of other, larger preforms made for the same concentrations of minor components and larger, 1.5 L bottles molded from these larger preforms. Bottles and preforms were then cut in the manner earlier described and again analyzed at magnification of 5000x. This time, the longest direction in both the vertical and horizontal transverse planes were analyzed. It will be appreciated that the longest dimension in the horizontal transverse plane (X-Z plane) will be the same dimension as the radial (X) axis dimension in the axial plane of the article. Similarly, the longest dimension in the vertical transverse plane (Y-Z plane) will be the same dimension as the axial (Y) axis dimension in the axial plane. SEM analysis of the preforms of the 500 ~~mL~~ mL bottle showed a mean dimension of MXD-6 domains to be around 240 (radial) to about 280 (axial), while the preforms of the 1.5L bottle showed a mean dimension of the domains to be about 300 in both the radial (X) and axial (Y) direction. In both of these preforms, the dimensions are so low that they are before, not within, the visible spectrum and therefore, no haze is seen.

20. Please amend the paragraph at page 31, lines 25 – Page 32, line 2; at line 28, replacing Cobiter 80 with COBITER® 80 Polyester Resin of COBARR S.p.A., so as to properly associate the tradename. At line 30, correcting the spelling of the word perform.

Further testing included the production of yet another bottle having a different resin formulation and a different amount of MXD-6. In particular, a polymer matrix was made with a polyester (VFR) resin containing 10 % IPA added of PET (~~Cobiter 80~~ COBITER® 80 Polyester Resin of COBARR S.p.A.) for a final formulation of 8.6% IPA. To this resin was added 9.3% of MXD-6. A 38 gram preform was extruded from which a 1.5L bottle was made by blow molding. SEM analysis was then ~~performed~~ performed on both the preform and the bottle from cuts providing dimensions in the radial and the axial directions. The results showed a mean dimension of the domains in the preform to be about 330 nm in the radial (X) direction and about 320 nm in the axial (Y) direction. Again, this was well below the visible spectrum.

21. Please amend the paragraph at page 32, lines 9 – 18, at lines 10 and 15 replacing Renol with the registered mark. At line 14 replacing Cobiter 80 with COBITER® 80 Polyester Resin of COBARR S.p.A. At line 16, inserting the obviously omitted word “by” to correct the grammar.

With an aim towards understanding the prior experimental data obtained, some films with different amounts of ~~Renol~~ RENOL® Red-4 colorant from ColorMatrix Corp. were prepared. The experimental data obtained showed an absorbance of this colorant in essentially the same region of the MXD6 domains radial dimension distribution of the 0.5 L bottle. Samples were made of cast films with thickness of about 200 microns on a Bausano double screw extruder with PET (~~Cobiter 80~~ COBITER® 80 Polyester Resin of COBARR S.p.A.) resin adding different amount of ~~Renol~~ RENOL® Red-4 at 0.05%, 0.1%, 0.2%, 0.25%, and 0.5% of weight. The blend was obtained by dry blending the right amount of colorant in 2.5 kg of PET for each test in a steel container under essentially standard conditions of temperature, pressure and screw speed.

22. Please amend the paragraph at page 32, lines 19 – line 26, at line 19, replacing was with were to correct the grammatical error.

The obtained films ~~was~~ were then placed on the 0.5 L bottle first, and then on the other bottles, to understand if the colorant is able to mask haze, and in this case, to find the minimum amount of color required. The realized film and each film's capability to cover haze are summarized in the Table I below. Since visual haze can be a subjective interpretation of the eye sight of the beholder, the capability of cover haze was analyzed by asking different people to see through the bottle covered by the different cast films with different amount of colorant and report whether they can visualize any haze.

23. Please amend the paragraph at Table I, at line 31, indicating that RENOL® is a trademark.

TABLE I
TESTING OF INDIVIDUALS FOR PRESENCE OF VISUAL HAZE

Color Concentration	Substantially Covered Haze? (Agreement of All)		
% (Renol <u>RENOL®</u> Rcd)	0.5L, 5%MXD	1.5L, 5%MXD	1.5L, 9.3%MXD
0.05	No	No	No
0.1	No	No	No
0.2*	No	No	No
0.25	Yes	--	No
0.5	Yes	Yes	--

* obtained by using two 0.1% films

– different interpretations (inconclusive)

24. Please amend the paragraph at page 33, lines 8 – 14, at lines 9 and 14, indicating RENOL® as a trademark. At line 10, correcting the typographical error of 2.5% to 0.25%. It should be noted that an amendment to the typographical error has ALREADY been entered and accepted by the Examiner.

The above experiment shows that, while the red color is able to cover the haze somewhat, even at 0.5%, the minimum concentration of ~~Renol~~ RENOL® Red to substantially mask the haze for the 0.5L bottle was ~~2.5%~~ 0.25%, while the 1.5L bottle required a higher concentration, about 0.5%. For the 9.3% MXD bottle, the haze did not disappear when the red colorant was used. It is believed, based upon the spectra that significant dimensions were present outside the region at which the ~~Renol~~ RENOL® Red could adequately absorb light. Consequently, haze remained.

25. Please amend the paragraph at page 33, line 15 to 21, at line 19, changing the singular verb “is” to the plural “are” to agree with the noun results.

To confirm this theory, films of different concentrations were made containing a blue colorant, namely Tersar blue 37843 from Clariant. Upon viewing its spectrum, it can be seen that the light is absorbed from about 490 nm up to about 700 nm, or very close to the end of the visible spectrum. Then, visual tests were conducted with several individuals. The results of the testing ~~is~~ are shown in Table II below, wherein it is clear that the use of 0.5 percent of the blue colorant effectively masked the visual haze in the bottle.

26. Please amend the paragraph at page 34, lines 1 – 5, at line 4, indicating **RENOL®** as a trademark. At line 4, correcting the typographical error of 2.5% to 0.25%. This is the same typographical error from Page 33 and the same analysis of the error applies here.

In addition to the above, the physical haze of the bottles was measured. In each instance, whether the bottle was without colorant or with colorant, there was still a significant physical haze present. In at least one instance, it appears that physical haze was reduced using the ~~Renol~~ **RENOL®** Red at ~~2.5%~~ 0.25% concentration, but still significantly present in the bottle.

27. Please amend the paragraph at page 34, lines 21 – 28, at line 25, replacing Cleartuf with **CLEARTUF®** to properly associate the trademark.

The wall of the container was prepared from a 52.5 gram preform manufactured on an Arburg 420c, 110 ton unicavity machine. The preforms contained about 4 and about 6 percent by weight MXD6 Grade 6007 from Mitsubishi Gas Chemical and about 96 and about 94 percent by weight polyethylene terephthalate grade ~~Cleartuf~~ **CLEARTUF®** 8006 from M&G Polymers USA, LLC, Sharon Center, Ohio, respectively. The preforms were blown into standard round bottom 2 liter bottles. The wall was removed and clamped flat between two black boards with a 66 mm x 80 mm opening in the center.

28. Please amend the paragraph at page 34, line 29 – page 35, line 3, at line 30 to correct the spelling of perpendicular.

The clamped boards with the sidewall in between them were suspended ~~perpendicular~~ perpendicular to the tabletop. A 6000 Watt halogen lamp attached to a variable power source was placed about 14 inches from the wall and about 7 inches from the top of the table. The light source was shielded from the wall by placing a container over the lamp. The container had a 45mm hole in the side located about 7 inches from the table top to allow the light to pass from the source and strike the cut out bottle sidewall.

29. Please amend the paragraph at page 37, lines 21 – Page 38, line 8, at line 22, deleting the word “a” since there were bottles made. At line 24, making mils plural because 15 is not a single number. At line 29, making spectra singular as there is only one visible spectrum.

This concept has been demonstrated in the following experiment. MXD6 6007 was melt blended into polyethylene terephthalate and made into [a] 16 oz. bottles. The bottles contained 3% of a colorant (Sprite Green) with absorbance and a domain distribution as shown in comparison in Fig. 10. The wall was 15 ~~mil~~ mils thick. Even though there is only an absorbance of 0.07 (15% of the light) between 500 and 550 nm, and there are 27 domains in that region, there was still strong enough absorbance elsewhere to substantially reduce the visual haze of the bottle sample. Since the 27 domains are only 16% of the total 166 domains in the visual ~~spectra~~ spectrum (400 to 700nm), the stronger absorbance elsewhere reduced the haze. When calculating for the total amount of relative light available for reflectance (*i.e.*, not absorbed by the colorant) for the bottle sample, that amount is less than 9.6. Thus, while the bottle has a slight amount of visual haze, the absorbance of the colorant is considered enough to substantially cover the dimensions of the domains found in the article. That is, the overall visual haze has been substantially reduced. Variations to further reduce the visual haze could be made by increasing the amount of or the type of absorbent composition(s), which would, in turn, change the absorbances at those wavelengths between 500 and 550 nm. To the extent that all of the other wavelengths are “covered,” any appreciable change in further masking the visual haze of the article may come from increasing the absorbance at those wavelengths between 500 and 550.

30. Please amend the paragraph at page 38, lines 9 – 29, at line 26, at line 28, and line 30 replacing spectra with spectrum as an article can only have one spectrum at a given location, there is one visible light spectrum and there is one spectrum in the range of 400-700.

The number of domains is determined by the SEM. The percent light absorbed was obtained by the absorbance ~~spectra~~ spectrum which is a function of the thickness of the wall. The fraction of light is the lumens or luminance at that wavelength divided by the total lumens or luminance of the visible ~~spectra~~ spectrum. For a light of constant intensity, the number is 1/300 because the total intensity is equally distributed across the ~~spectra~~ spectrum of 400-700 nanometers.

31. Please amend TABLE III, at page 39, lines 23 – 28, at line 25, change Renol to RENOL® twice and Tersar to Tersar twice.

TABLE III

X VALUES FOR COLORANTS USED IN PET/MXD6 BLENDS

	Renol <u>RENOL®</u>	Renol <u>RENOL®</u>	Green 0.1%	Green 0.25%	Green 0.5%	Tersar <u>Tersar</u> Blue 0.05%	Tersar <u>Tersar</u> Blue 0.1%
6% MXD	10.602	9.167	9.195	7.493	5.573		
8% MXD	9.899	8.167				9.953	7.272

32. Please amend the paragraph at page 39, line 29 to page 40, line 15, at line 1, change Renol to RENOL® and Tensar to Tersar at lines 2 and 3.

These bottles were then evaluated separately and subjectively to determine whether they reduced or eliminated visual haze. It was determined that neither of the 0.05% ~~Renol~~ RENOL® Reds were sufficient to reduce haze, but that at 0.1% the Reds did start to adequately reduce visual haze. Likewise, the 0.05% ~~Tensar~~ Tersar Blue was not sufficient to reduce visual haze, but the 0.1% ~~Tensar~~ Tersar Blue was adequate to reduce the visual haze of the bottle. For the Greens, each green reduced the visual haze to some extent, with higher amount of colorant providing for a better visually acceptable product with reduced visual haze. This was true even though a notable amount of light was transmitted between about 480 nm and 540 nm. However, this green colorant absorbs substantially all, if not all, of the other wavelengths where domains are present, including a significant amount of light at about 584 nm, where a large number of domains existed. Thus, upon calculation of the X value for the colorant, it was determined to be well within the limits of X being less than 9.6. Experimentation has shown that the commencement of some masking of haze can be set at X=9.55. Thus, it should be evident that, provided the total amount of relative light not absorbed is less than 9.6, at least some of the haze visible to the naked eye of an observer will be masked.

As always, the Commissioner is authorized to deduct any fees from Deposit Account 503651.

Respectfully submitted,

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